

Appendix table 5-55.

Citations of U.S. patents to U.S. literature, by field and sector: 1987, 1990, 1994, and 2000
 (Percent share)

Cited Sector	Cited scientific field												
	All fields	Clinical medicine	Biomedical research	Biology	Chemistry	Physics	Engineering and technology			Social science	Professional fields	Health sciences	
		2000					Earth and space	Mathematics	Psychology				
Total citations (number)													
Total (percentage)	91,389	26,355	44,857	2,300	7,649	5,240	284	4,403	29	118	19	86	46
Total (percentage)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic	60.0	60.3	61.1	69.3	64.3	46.2	63.7	48.5	62.1	73.7	78.9	86.0	45.7
Industry	20.1	16.0	17.3	14.7	25.4	41.6	16.9	41.7	20.7	6.8	15.8	10.5	26.1
Federal Government	7.5	9.3	7.8	11.2	3.4	3.9	9.2	2.7	0.0	1.7	0.0	0.0	8.7
State and local government	0.4	0.7	0.4	0.1	0.0	0.0	1.1	0.1	0.0	0.8	0.0	0.0	2.2
FFRDCs	1.8	0.7	1.4	0.4	3.9	6.7	4.2	4.2	10.3	0.0	0.0	0.0	0.0
Nonprofit	9.7	12.1	11.6	3.6	2.8	1.1	1.4	1.5	0.0	11.0	0.0	1.2	8.7
Unknown	0.6	0.8	0.4	0.5	0.2	0.3	2.1	1.3	3.4	4.2	0.0	1.2	4.3
1997													
Total citations (number)	66,277	19,584	31,832	1,412	5,849	3,907	181	3,419	28	35	0	0	25
Total (percentage)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic	57.9	58.8	59.2	68.7	63.6	42.4	51.9	44.5	67.9	65.7	na	na	44.0
Industry	20.5	15.8	16.9	13.5	27.1	42.2	24.3	46.7	25.0	5.7	na	na	0.0
Federal Government	8.6	10.4	9.4	12.6	3.3	5.6	9.9	2.6	0.0	2.9	na	na	12.0
State and local government	0.6	1.0	0.6	0.2	0.2	0.0	1.1	0.0	0.0	0.0	na	na	20.0
FFRDCs	1.7	0.9	1.2	0.6	2.7	7.2	6.1	3.9	0.0	0.0	na	na	0.0
Nonprofit	10.1	12.3	12.2	4.0	2.9	2.2	2.2	1.3	0.0	17.1	na	na	16.0
Unknown	0.6	0.8	0.5	0.2	0.2	0.3	2.8	0.9	0.0	0.0	na	na	0.0
1994													
Total citations (number)	24,890	6,291	9,221	646	2,991	3,393	102	2,210	13	13	0	0	5
Total (percentage)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic	55.7	60.3	60.4	67.8	63.5	35.7	46.1	40.3	84.6	76.9	na	na	40.0
Industry	24.4	13.7	17.0	14.2	27.3	48.0	28.4	48.3	7.7	0.0	na	na	0.0
Federal Government	8.1	10.5	9.6	14.1	3.0	5.4	10.8	4.3	0.0	15.4	na	na	0.0
State and local government	0.7	1.2	0.8	0.3	0.1	0.0	2.9	0.0	0.0	0.0	na	na	40.0
FFRDCs	2.8	0.8	1.3	0.5	3.5	8.9	2.9	5.1	7.7	0.0	na	na	0.0
Nonprofit	7.8	12.8	10.3	2.3	2.4	1.8	3.9	1.5	0.0	0.0	na	na	0.0
Unknown	0.4	0.6	0.4	0.3	0.1	0.1	1.0	0.5	0.0	0.0	na	na	0.0
1990													
Total citations (number)	11,940	2,984	3,427	298	1,633	2,119	69	1,380	2	23	0	0	1
Total (percentage)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Academic	51.9	58.4	61.9	67.1	56.5	34.4	37.7	31.0	100.0	87.0	na	na	0.0
Industry	28.1	12.9	15.3	9.7	34.5	49.3	36.2	56.7	0.0	0.0	na	na	0.0
Federal Government	8.4	10.9	10	19.8	3.3	6.8	11.6	4.6	0.0	0.0	na	na	0.0
State and local government	0.7	1.5	1.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	na	na	0.0
FFRDCs	3.1	0.7	1.2	0.3	3.1	8.3	7.2	5.6	0.0	0.0	na	na	0.0
Nonprofit	7.3	15.0	10.0	2.0	2.3	1.0	4.3	1.2	0.0	4.3	na	na	0.0
Unknown	0.4	0.5	0.5	0.3	0.1	0.1	0.0	0.7	0.0	0.0	na	na	0.0

See explanatory notes, if any, and SOURCE at end of table

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Cited Sector	Cited scientific field												
	All fields	Clinical medicine	Biomedical research	Biology	Chemistry	Physics	Engineering			Social science	Professional fields	Health sciences	
							Earth and space	and technology	Mathematics				
1987													
Total citations (number)	7,845.0	1,889.0	2,133.0	164.0	1,127.0	1,226.0	101.0	1,186.0	0.0	13.0	1.0	1.0	0.0
Total (percentage)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	na	100.0	100.0	100.0	100.0
Academic	49.1	56.7	62.4	58.5	58.6	28.2	39.6	24.8	na	84.6	100.0	0.0	na
Industry	28.6	13.7	12.0	9.8	30.4	52.3	24.8	59.5	na	7.7	0.0	0.0	na
Federal Government	9.2	12.1	10.0	28.7	4.9	6.9	17.8	5.9	na	0.0	0.0	0.0	na
State and local government	0.8	1.6	1.2	0.0	0.0	0.2	3.0	0.0	na	0.0	0.0	0.0	na
FFRDCs	3.7	1.2	0.7	0.6	2.8	11.2	10.9	6.0	na	0.0	0.0	0.0	na
Nonprofit	8.1	14.0	13.4	1.8	2.9	1.0	1.0	3.1	na	7.7	0.0	100.0	na
Unknown	0.4	0.6	0.2	0.0	0.2	0.2	0.0	0.6	na	0.0	0.0	0.0	na

FFRDCs = Federally Funded Research and Development Centers. na = not applicable.

NOTES: The number of citations by U.S. patents is based on a three-year lag with a 12-year window of U.S. articles in the entire set of approximately 5,000 journals covered by the ISI. For example, the 2000 citations would be patents issued in 2000 citing U.S. papers published 1997 and 1986, and so forth. Sector is determined by the institutional address of the cited paper. Scientific field is determined by CHI's classification of the journal. Computer sciences is included in engineering and technology.

SOURCES: U.S. Department of Commerce, Patent and Trademark Office; CHI Research, Inc., Science Indicators and patent databases; and National Science Foundation, Division of Science Resources Statistics (NSF/SRS).